Center for Advanced Imaging LADAR
Utah State University

Robert T. Pack, Director

Bringing a New Class of Three Dimensional Color Cameras to the Market

MANAGEMENT TEAM

- **Robert Pack**, Director
  - > Research Professor, VP Lidar Pacific Corporation
- **Paul Israelsen,** Co-Director
  - > Research Professor, Former CTO Sorenson Vision
- **Ray DeVito**, Commercialization Manager
  - > USU Office of Technology Commercialization
- **Lloyd Alexander**, Marketing Consultant
  - > Gamut Technology Group
- **James Cantrell**, Marketing Consultant
  - > Strategic Space Development

MANAGEMENT

Annual Mass Market - 3D Cameras

- Hand-Held Cameras - $90 Million
- Airborne Cameras - $200 Million
- Space borne Cameras - $16 Million
- Software - $135 Million

Problem/Opportunity

- **3D Cameras are not a mass market:**
  - > Systems are too slow and awkward
  - > Hard to get error free color 3D images
  - > Do not work at long distances
  - > Scene/camera motion creates irrecoverable errors
- **Mass Market Acceptance Requires:**
  - > Streamlined speedy operation
  - > Error free operation
  - > Ability to work at a variety of distances
  - > Able to handle scene/camera
  - > Lower cost

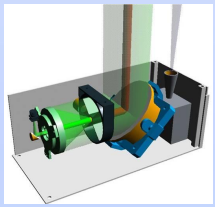
Our Potential Products

A family of products based on laser radar (LADAR) that can create error free 3D color models of real life scenes

GREAT DEVICES

HAND-HELD

AIRBORNE



SPACE BORNE

EASY WORKFLOW INTEGRATION

CAD

VIEWERS

VIDEO

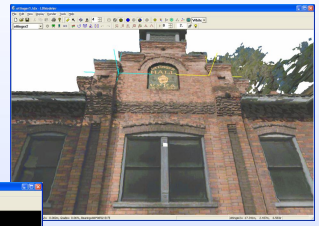
GAMES

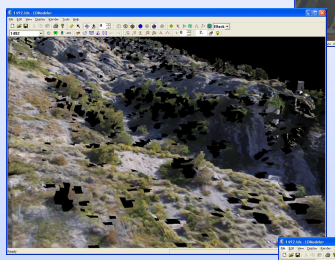
ROBOTICS

GUIDANCE

GROWING THIRST FOR 3D DATA PRODUCTS

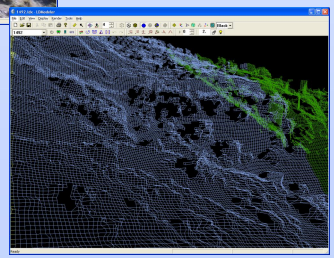
DESIGN





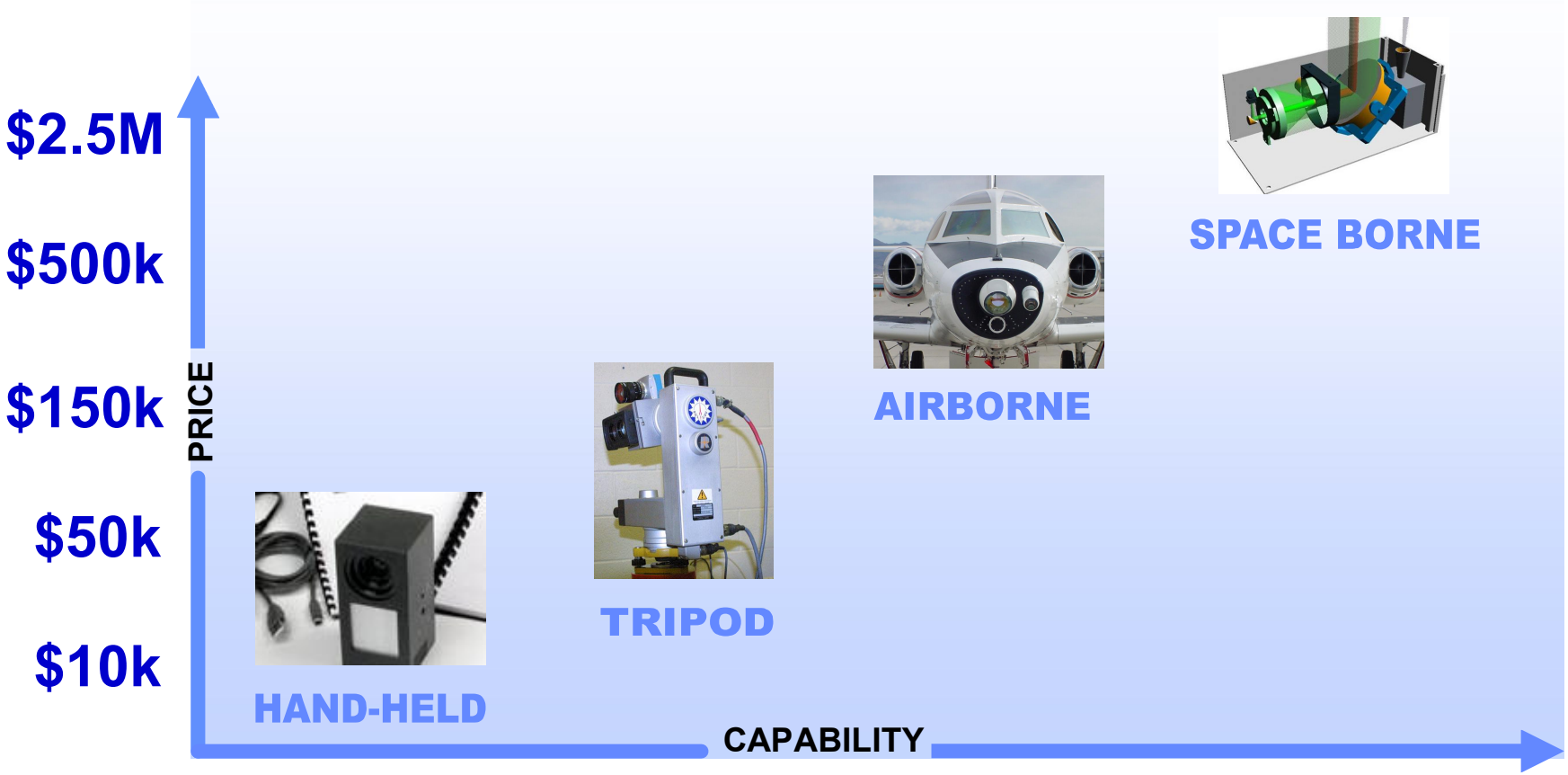
MAPPING

NAVIGATION



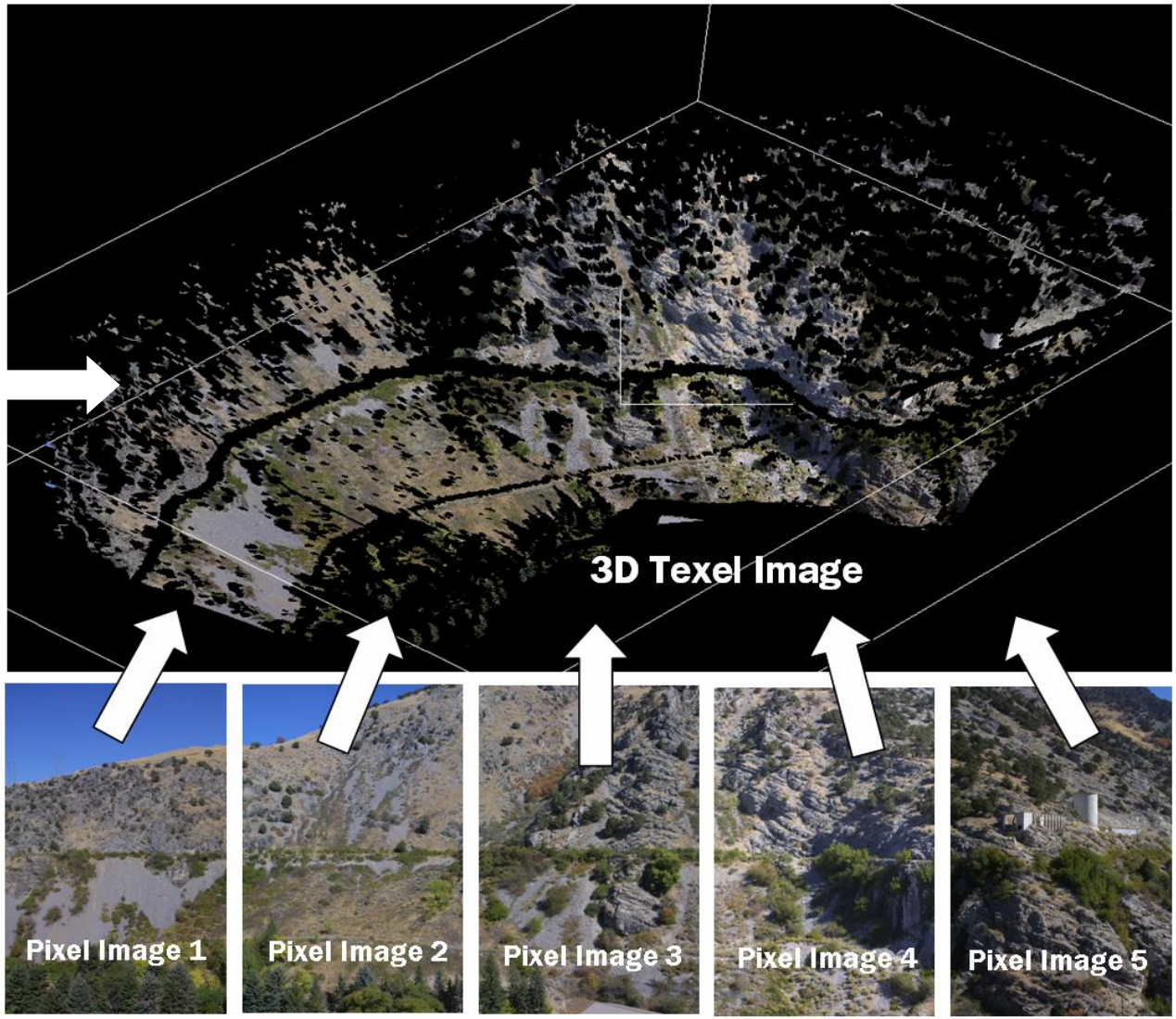
Price Positioning

Unit prices are compatible with current systems that have no or limited color capabilities.

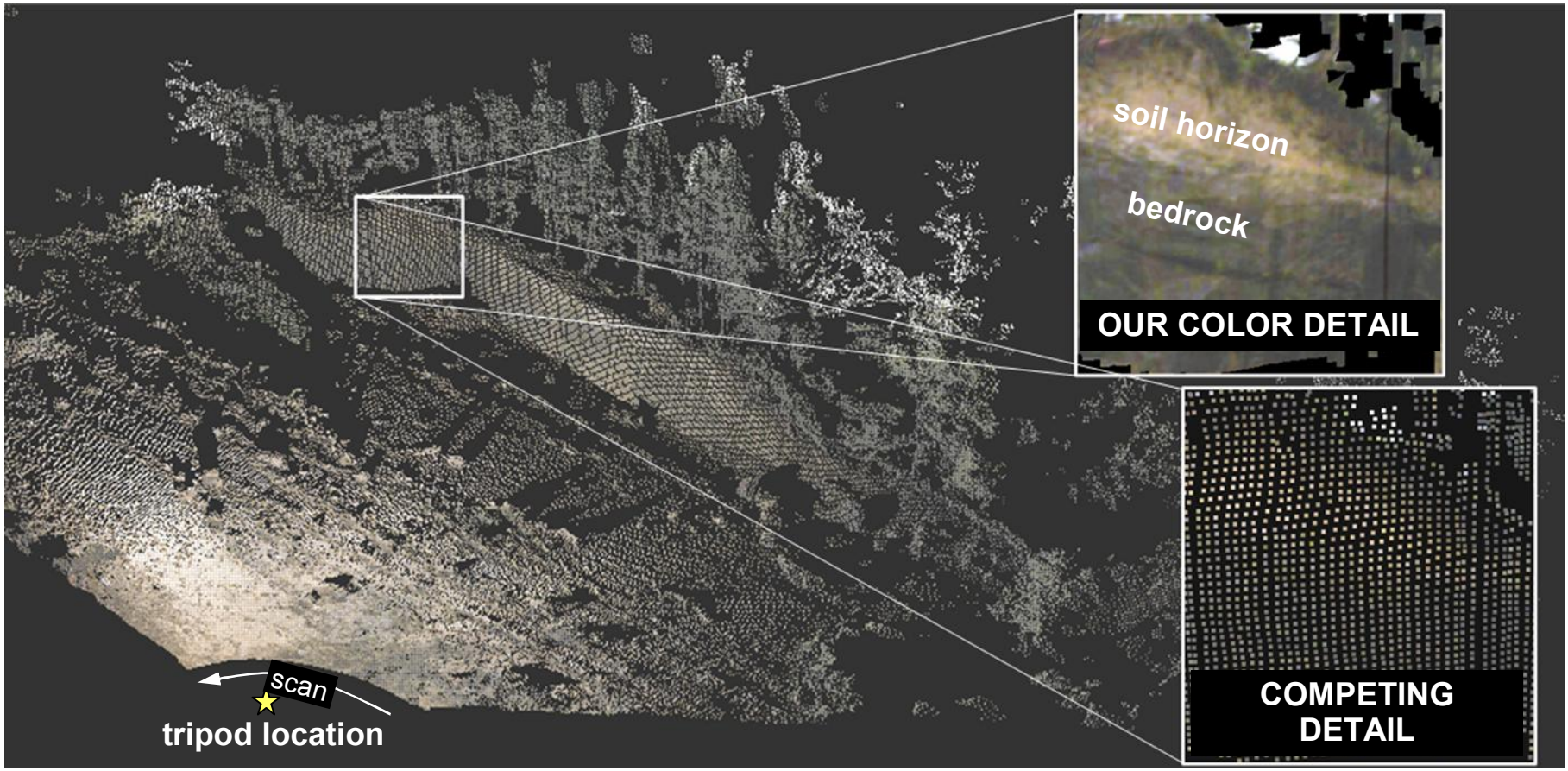


Long Distance Tripod Product

Mountainside in Logan Canyon



Long Distance Tripod Product



Data Produced by CAIL – Utah State University

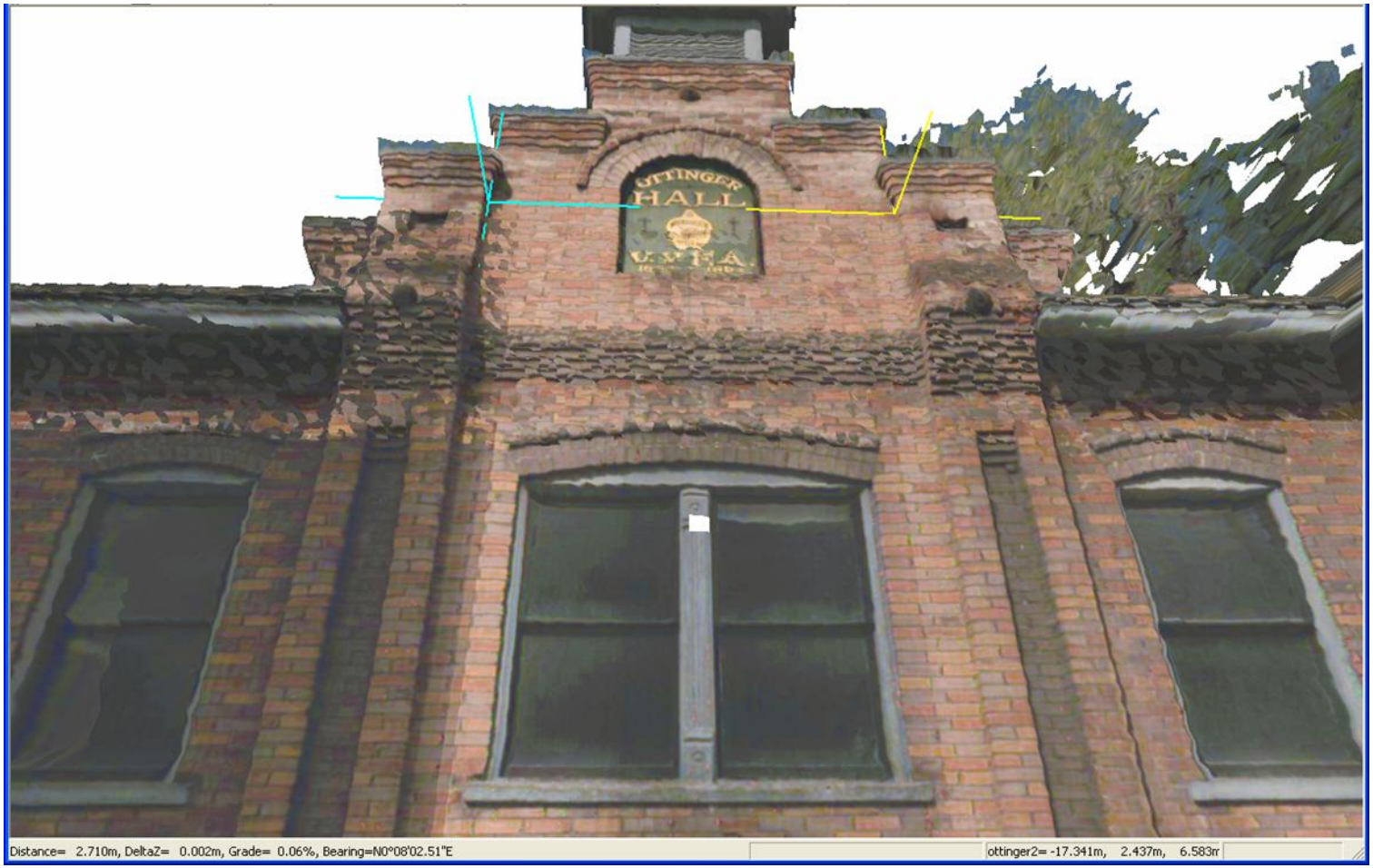
Display Software by Rappid Mapper Inc.

3D Rockslide near Ojiya, Japan

CAIL

Utah State University

Medium Distance Tripod Product



Data Produced by CAIL – Utah State University

Display Software by Rapid Mapper Inc.

Ottinger Hall, Salt Lake City

CAIL

Utah State University

Short Distance Tripod Product

Data Produced by CAIL – Utah State University

Display Software by Rappid Mapper Inc.

3D Car in Kennecott Mine, Utah

CAIL

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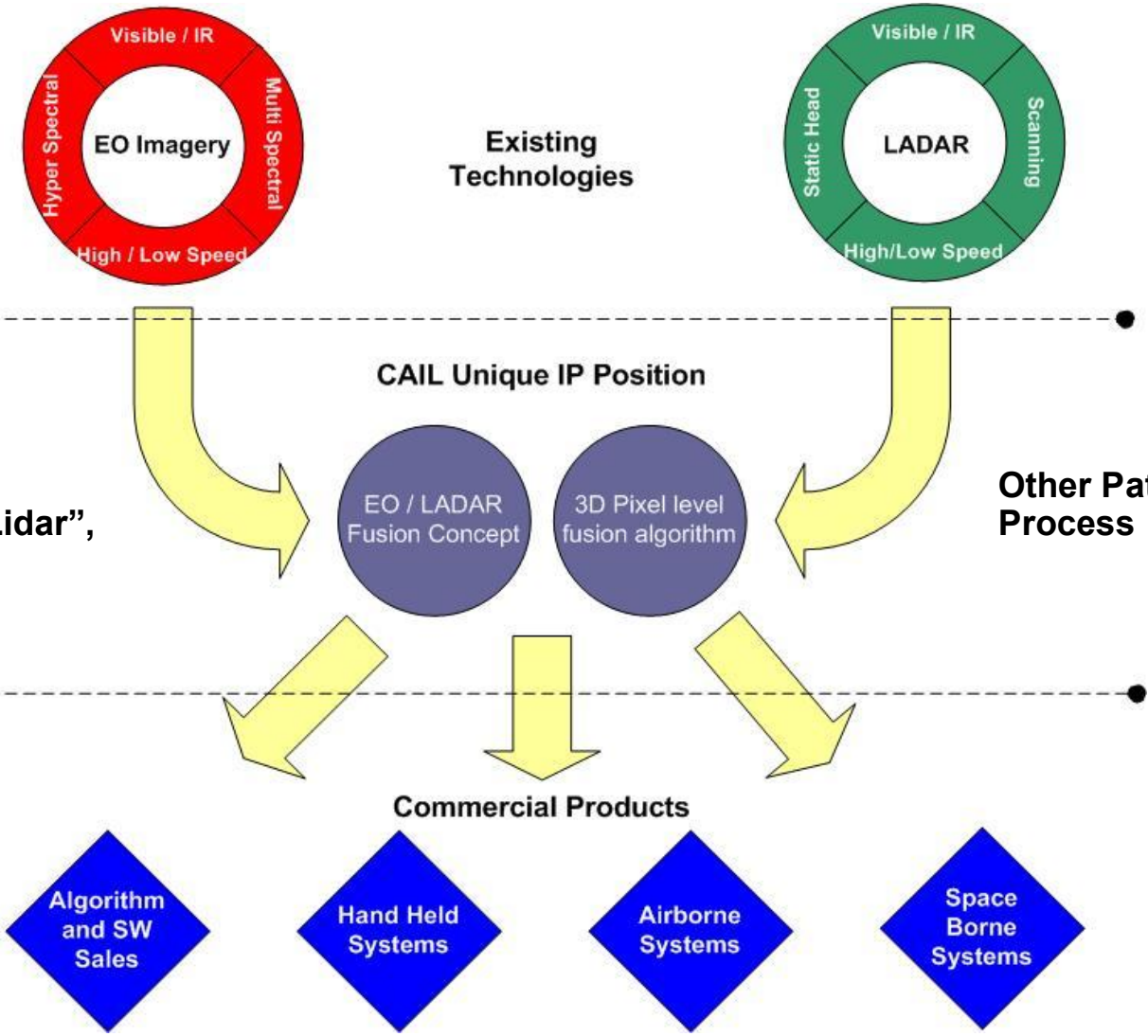
Increasing Need for 3D Pictures in the Market Place

- **Movie and Gaming Industry**
  - > Inserting real-life scenes into 3D computer graphics
- **Engineering Design and Land Development**
  - > Industrial plants, architecture, real estate, hazards analysis
- **Law Enforcement / Crime Scene Analysis**
  - > On-the-spot documentation of evidence
- **Utilities and Infrastructure Management**
  - > Includes documentation for insurance claims
- **Manufacturing Quality Control and Assy Lines**
  - > Large to small object tracking and analysis
- **Mapping, Targeting and Navigation**
  - > Military, shipping, aircraft and robot applications

CAIL IP Position



Patent "3D Multispectral Lidar", Dec. 2003

Other Patents in Process

Problems We Uniquely Solve With Our IP

- **Faster acquisition of 3D color imagery**
  - > Other systems use fusion methods that require time-consuming error correction
- **Real-time image viewing and analysis**
  - > We can view and QC data in the field – we are the only ones
- **Handles camera and or object motion**
  - > Errors are not introduced when moving as with other systems
- **Can provide instantaneous earth coordinates for any object**
  - > Important in tactical military operations and land development
- **Compact, lightweight, portable**
  - > We can be as small and portable as any other system
- **Unique capabilities will accelerate market adoption of 3D cameras**

Overall Business Strategy

- **Goal: Facilitate the launch commercial entity to service IP sales and commercial products**
- **Primary Challenges**
  - > Market entry barrier due to high capital costs
  - > Development of market position before competition
  - > Balance of market position in software, IP licensing, and product development
- **Overall strategy**
  - > Pursue military and civil space opportunities to fund NRE on airborne and space-borne products (long time to sale)
  - > Develop hand held product and co-produce with commercial partner
  - > Develop IP and software sales
  - > Be as rapid to market as possible with blocking patents to buy time

Current Investors/Funding Agencies

- Utah Centers of Excellence Program
- Rappid Mapper Inc. – Salt Lake City
- Lidar Pacific Corporation – Waipahu, HI
- U.S. Naval Air Warfare Center – China Lake, CA
- U.S. Army Missile Research Development Engineering Center – Redstone Arsenal, AL
- Defense Advanced Research Programs Agency – Washington D.C.
- Pacific Northwest National Laboratories

Where We Are

- Units to-date: 2 Prototypes developed
- Employees in CAIL – 13 faculty, students and consultants
- Completing a product manufacturing risk/cost analysis
- Financing – Have received $270,000 from Utah Centers of Excellence Program to date
- Current Research Funding - $385,000
- Raising $500,000 to complete airborne prototype
- Seeking manufacturing license

What We'll Do

- 3 Handheld products in the market by CY06
- Complete airborne prototype
- Facilitate launch of manufacturing capability
- Facilitate mass market distribution
- Continue developing IP and seeking patents
- Market to military and space communities

THANK YOU